Introduction

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The focus of this Handbook is on the development, nurturance, and enhancement of creative processes and creative achievement across the lifespan. What do we currently know about the development of creativity? How can we develop the processes important for creative thinking, and how can we help individuals translate that creative potential into creative achievement throughout their lives? We are pleased that leading scholars and researchers in the field agreed to contribute to the Handbook and share their perspectives. There are 25 chapters addressing a variety of topics in the area. This Handbook provides a review of each area, including current research findings, consensus in the literature, best practices in each area, and key questions for future research. In addition, many chapters raise provocative questions that point the way for future consideration and research.

This book has five sections, beginning with Part I, "Core Concepts of Lifespan Creativity Development." Authors review basic concepts of creativity, pretend play, brain development, and lifespan development. In Part II, "The Development of Creativity," authors review the existing literature in areas of child development, first focusing on preschool children, then school-age children, then adolescence. Next, the development of creativity in adulthood and old age is discussed. In addition, developmental issues in measurement and in identity development are focused on.

In Part III, "Modes of Enhancement," the Handbook addresses the facilitation and enhancement of creativity across the lifespan. A variety of approaches are used in different domains of talent. Modes of enhancement of creativity discussed in various chapters are imaginary companions, imaginary worlds, videogames, and reading and writing. Finally, enhancement programs on a large scale are investigated in China.

Next, Part IV, "Environments and Contexts," focuses on the role of the environment in creative enhancement and expression. Environments of the classroom, museums, Makerspaces, workplace, and culture are reviewed. Authors answer questions such as what kinds of classrooms nurture creativity in children, what modes of expression of creativity obtain in adulthood, and what kinds of work environments and social environments facilitate and reward creative thinking.

Finally, in Part V, "Special Populations," authors focus on special populations, including the development and enhancement of creativity in gifted and

talented students, as well as children with special needs or developmental disabilities. This section also addresses the relevant lifespan development of creativity in eminent creators. Finally, the Epilogue is a synthesized conclusion written by the editors. We present what we have learned from these outstanding creativity scholars and point to directions for the future.

PART I

Core Concepts of Lifespan Creativity Development

1   Basic Concepts of Creativity

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1.1 Basic Concepts of Creativity

What does it mean to be creative? How can creativity be quantified, if at all? How important is creativity to personal and professional life in the modern world? What is the developmental trajectory of creativity? Questions like these are often posed by researchers studying creativity and could potentially be of interest to laypersons as well. The primary difference may be that researchers use scientific means to answer such questions, whereas they may represent mere random musings for the general public. Like any discipline, creativity science has its set of conceptual models and thematic emphases that have developed the field over time. For instance, researchers do have a fairly good idea about how to quantify creativity and how to foster it in different contexts. Similarly, researchers have proposed models delineating how creativity develops over the lifespan, and this book is evidence of the same. Thus, in order to provide a general background of creativity, this chapter outlines its basic concepts, including definitions, models, theories, and categorizations with a developmental focus.

But first, how did creativity research come to be? Detailed historical accounts of creativity can be found elsewhere (e.g., Glăveanu, 2019; Glăveanu & Kaufman, 2019), though arguably one of the most pivotal events to bring creativity into the foreground of scientific investigation was J. P. Guilford's presidential address to the American Psychological Association in 1950. He elucidated the neglect of research on creativity, originality, imagination, and associated constructs, presenting a compelling case for a rigorous examination of creativity (Guilford, 1950). He went on to propose ideas and themes for future hypotheses to facilitate such research, such as suggesting tests to assess creative thinking in novel ways. For example, "one might name common household appliances, such as a toaster, or articles of clothing, such as trousers, and ask the examinee to list things that he thinks are wrong or could be improved" (p. 452); although he did not develop this specific test, the item highlighted a core tenet of creativity assessments: that multiple answers were sought. In addition to fluency (number of ideas), Guilford also described originality (statistically infrequent or uncommon responses) and flexibility (ease with which response categories or sets are changed) as being vital to understanding creativity. Since these early beginnings, creativity science has advanced tremendously with an equal measure of debate and consensus across the field.

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1.1.1 Definitions, Four Ps, and Five As

Although creativity may be considered an esoteric discipline, in part due to the seeming difficulty of describing it, researchers and academics agree on two components that make an act creative: originality and effectiveness (Barron, 1955; Plucker & Beghetto, 2004). Originality or newness represents the novelty of the outcome, by virtue either of no one having thought about the idea before or of it being an infrequent, non-obvious response (Boden, 2004; Simonton, 2016). Effectiveness or utility of a response suggests that originality alone is insufficient to make an idea creative; the idea also needs to have value, worth, or use in a given context. Together, these two properties serve to make an act creative; however, the act in question also needs to be judged as such. Stein (1953) proposed that all creative acts required social evaluation or acceptance at a group level for them to be considered truly creative. This element of social consensus also features in how researchers measure and assess creative outcomes in studies (e.g., the Consensual Assessment Technique; Amabile, 1982). The definition of creativity has stood the test of time, with few (if any) modifications being suggested over the years (see also Kampylis & Valtanen, 2010).

Another aspect of creativity that is similarly perennial is an overarching framework within which it is examined. Mel Rhodes (1961) developed the Four Ps model of creativity – a model that lends a strong scaffolding to classic and contemporary studies in the domain to date. The Four Ps are person, process, product, and press. The person represents the individual who is creative, including their personality characteristics, attitudes, and temperament. For instance, research has consistently shown that the trait of Openness to Experience, one of the Big Five, has strong and positive associations with creative thinking and abilities (Batey & Furnham, 2006; Feist, 1998; Kaufman, 2011). This and similar research represent an investigation into the person P of creativity. The process P refers to the cognitive, motivational, socioemotional, and neuroscientific processes that underlie creative expression. When researchers ask participants to come up with ideas while their brains are being scanned or when electrodes are strapped onto their scalps, the creative process is being examined (e.g., Fink et al., 2009; Yoruk & Runco, 2014).

The third P, product, includes all the tangible and intangible outcomes of the creative process. These can be ephemeral ideas, marketable innovations, or just creations with no immediately discernible value. Nearly all creativity research that requires participants to generate novel responses assesses the products of ideation. Last, the press P includes the environmental and contextual factors within which the person uses the creative process to generate a creative product. Time pressure, autonomy, and encouragement all have different effects on fostering or dampening creative endeavors (e.g., M. Baer & Oldham, 2006). Taken together, the Four Ps encapsulate a large proportion of prominent research themes within creativity research (Williams, Runco, & Berlow, 2016).

Whereas Rhodes argued that the Four Ps are not mutually exclusive components within creativity and that each feeds into and off the others, they did

come to represent disjointed, almost silo-like entities within subsequent investigations. If researchers were determined to uncover the personality traits associated with creative production, they often ignored the broader environmental contexts within which the acts were being generated. The person–situation or interactionist perspective (Woodman, Sawyer, & Griffin, 1993; Woodman & Schoenfeldt, 1990) began to highlight the complexity of creative behavior by making initial linkages. Against such a background, the Five As of creativity were proposed, stressing that creativity was a deeply embedded sociocultural phenomenon with interrelationships and bidirectional pathways between its facets (Glăveanu, 2013, 2015).

The Five As (actor, action, artifact, audience, affordances) not only changed the nomenclature of the original Four Ps model but did so with the aim of integrating the building blocks of creativity, so to speak. The model also moved from a static conception of creativity and its components to a more dynamic and active one, as facilitated through the language used. The actor (person) is the individual whose past socialization and social history is accounted for when understanding personal attributes that prompt creativity. The actor is not an isolated being but an entity embedded in and shaped by societal contexts within which creativity emerges. The action (process) extends the internal cognitive dimension to include external implementation by focusing on the interplay between actors using actions to create novel outcomes. These artifacts (products) move beyond tangible outputs to notional and conceptual ones as well, with the word itself drawing from sociocultural and anthropological terminologies.

Glăveanu's (2013) model bifurcates the fourth P, press, into two sub-components – audience and affordances – to further direct our attention to the unshakeable interdependence between social and material contexts in the conceptualization of creativity. Social presses as represented by the audience comprise other participants in the family, community, or society at large that lend credence to the creative action (Glăveanu, 2013, 2015; Stein, 1953). The audience includes not only critics and contemporaries, but also other creators and colleagues who offer a wider context within which actions are applauded or dismissed. The physical materials with which creations are formed make up affordances – quite literally the material environment that actors can shape into creative artifacts. Awareness of available affordances also lends the opportunity to manipulate them in ways to attain the actor's goals. In fact, Glăveanu (2013) suggests that identifying and successfully utilizing affordances represents a course by which creativity develops: "first becoming able to observe and make use of affordances in the surrounding environment and then mastering this use and altering affordances, adapting what already exists and creating new artifacts with new affordances" (p. 76). Glăveanu's Five As shifted the focus toward a more interconnected study of creativity – one that requires and indeed thrives when contextual influences are taken into account – in an action-oriented conceptualization of the term (see also Glăveanu et al., 2020).

1.1.2 The Four Cs

Another number–letter model of creativity is the Four C model (Beghetto & Kaufman, 2007; Kaufman & Beghetto, 2009) that categorizes the gradations of creativity based on developmental, hierarchical progression. Often, systematic investigations of creativity take one of two routes: *little-c*, or the type of everyday creativity that everyone engages in, and *Big-C*, or eminent creative genius. Kaufman and Beghetto (2009) appended two categories to this classification: *mini-c*, which encompasses personal insights at the genesis of creativity, and *Pro-c*, or expert-level creativity. Such a disaggregation facilitated the categorization of the units of analyses of creativity research, that is, whether they are members of the general population or renowned creators. For instance, Big-C creativity is rarer, less frequently encountered, and often examined via case studies or historical data. On the other hand, little-c is often studied through psychometric tools and is easier to sample (Kaufman & Beghetto, 2009).

The model also represents a sequence of the development of creative skills (from mini to Big), although it does not commit to being a purely linear model where each preceding stage must be achieved before progressing to the next. However, typically individuals begin by exploring mini-c activities early in childhood (making home videos), and may move on to the domain of little-c, if they are duly encouraged and supported (progressing to refining their videos through basic video and audio editing and showing their work to others). Within little-c, some may stagnate, remaining content with this level of creative expression, whereas some may flourish (most likely) within a particular domain and advance to the Pro-c stage (making documentaries that are screened at the local film festival circuit). Professional-level contributions that have not yet attained the status of eminence are included here, and some may achieve local or national acclaim for their creativity. Finally, whether or not Pro-c creators make it to Big-C status is a matter of time and/or social recognition, but the model emphasizes the importance of distinguishing the continuum of prior creativity stages (winning an Academy Award for Best Documentary Feature). Approaching the study of creativity in this developmentally salient manner sheds light not only on the conventional classifications of creative acts (everyday and eminent) but also on the creativity displayed by young children and by budding professionals in their fields.

The Four C model and its representation of the creative trajectory over time, skill, practice, and expertise is crucial to our understanding of creativity across the lifespan. Another way to characterize the Four Cs would be to overlap them with theoretical conceptions of creativity. Although others (Kozbelt, Beghetto, & Runco, 2010) have also undertaken a similar analysis (in that case, mapping the Four Cs and other concepts across 10 different theoretical foundations), our chapter serves to highlight one key theory that we believe best embodies each C. Another difference from Kozbelt et al.'s earlier analysis is that the dominant theory chosen for each C not only represents that C but also applies to subsequent ones. This route is also taken in the absence of a grand unifying theory of

creativity to tie together its various facets (J. Baer, 2011). Given that we also recognize that a holistic approach to creativity does not necessarily translate to mutually exclusive categories, we illustrate the development of creativity via theories appropriate to the Four Cs. Although we focus on one theory or model per C, we will refer to and briefly discuss other relevant theoretical scholarship when relevant.

1.1.3 The Mini-c Stage and Creative Cognitive Processes

Let's start at the very beginning – creativity emerges from mental processes underlying original thought. In this vein, stage theories or process theories of creativity are salient and are tied to the genesis of creative ideation, that is, the mini-c phase. To reiterate, mini-c is personally meaningful, less contextually dependent, and more process focused (Kaufman & Beghetto, 2009). Some of the earliest theorizations of creativity were characterized through stages. Wallas (1926) in his book *The Art of Thought* presented what can be considered the first model of the cognitive process of creativity, based on an analysis of a speech given by physicist Hermann Helmholtz. In the first stage, *preparation*, the individual understands the setting of a problem, thereby consciously recognizing it. Next, in *incubation*, the problem recedes to the background, out of conscious awareness, though the mind continues to work on it involuntarily. If this stage is successful, the individual moves to *intimation* – a step often left out in modern retellings of Wallas's model, but one that represents an incremental link between stages and also between levels of conscious acknowledgment of the problem and solution (Sadler-Smith, 2015). Intimation is when the person realizes that a solution is forthcoming and close to realization. This moment is followed by *illumination*, where the solution appears to the person in an "aha" burst of insight. Last comes *verification*, where the individual consciously and effortfully applies the solution. These stages are likely recursive and non-linear, where an individual can go back and forth through these processes, particularly if a sub-optimal solution is reached (e.g., Kozbelt et al., 2010; Sawyer, 2012).

Although Wallas's stages were a good starting point, subsequent researchers realized the need to separate creative thinking into its components or sub-processes. Efforts to identify the processes underlying the stage of incubation as well as antecedent and consequent mental operations were of particular interest (Guilford, 1950). These may include problem construction, problem identification, problem definition and redefinition, divergent thinking, synthesis, analysis, evaluation, and monitoring (Guilford, 1950, 1967; Lubart, 2001; Mumford, 2001; Mumford, Mobley, Reiter-Palmon, Uhlman, & Doares, 1991; Sawyer, 2012; Smith, Ward, & Finke, 1995). An important model that predates this process orientation in creativity is Guilford's Structure of Intellect (SOI) model (Guilford, 1950, 1967), which was actually a theory of intelligence. Guilford distinguished between two kinds of mental processes: *convergent* and *divergent thinking*. Convergent thinking entailed using mental operations to

converge toward a single answer, possibly the most conventional one, whereas divergent thinking (DT) occurred when one could think in several directions, yielding novel combinations and associations. Both types of thinking are involved in creativity, particularly when we come up with several solutions (divergent) but then have to narrow them down to a few that we may choose to implement (convergent). Readers interested in this balance between divergent and convergent processes, particularly in creative problem solving, are referred to Mumford et al. (1991), Osborn (1963), and Lubart (2001).

Creative cognition, then, relies on numerous interconnected and intertwined non-linear processes that yield novel outcomes. Finke, Ward, and Smith (1992) narrowed these down to two higher-order processes of generation and exploration, which subsumed other sub-processes within creative ideation. In their *geneplore* (generate + explore) model (Finke et al., 1992; Smith et al., 1995), it was proposed that the individual first uses generative processes, like association and memory retrieval, to form mental representations of a potential solution; these were called preinventive structures. In the second exploration phase, the problem solver evaluates the fit of these mental representations to the problem at hand, and may return to the generative phase if the desired solution is not yet obtained. This cyclical model of generating ideas and exploring their effects clearly falls within the larger gamut of stage-based creative schema.

Thus, we argue that mini-c exemplifies process- and stage-based models of creativity. To illustrate this further, consider a young creator trying to find ways to spend time over the summer by themselves. An initial step in the creativity process will be to recognize that spending time alone may lead to boredom, something that they'd like to avoid. After constructing and identifying the problem herein, the person may decide to define the issue at hand by describing it: *I have six weeks of no activities planned in the summer and need to think of something to keep me occupied without my friends*. They may take additional information into consideration and redefine the problem as being: *I actually have four weeks of no activities planned, because I'll be away at Summer Camp for two weeks*. This restructuring and reorganizing of the problem often occurs when new information becomes known to the actor. In the next general phase, they might come up with several ways to kill time – get a hobby or a summer job, go away to stay with grandparents or extended family, try to convince their parents to take them to Disneyland, decide to accompany their parents to their workplace, and so on. The person may then use convergent thought processes to shortlist the most feasible options, synthesize them into one solution (perhaps not settling on one activity for the duration of four weeks but moving between them), and finally implementing and applying the solution. Midway through the summer, they may realize that the initial solution needs to be tweaked, and they move through the phases again, zigzagging between the ones they need to readdress and the ones they need to overlook. The processes and sub-processes of creative cognition are in a way the building blocks of creativity, akin to how mini-c is foundational to the development of subsequent creative expression.